

We claim:

1. A system, comprising:
a detector to detect a voltage stored in an ultracapacitor; and
an extractor to extract energy from the ultracapacitor when the voltage falls below
a predetermined value.
2. The system of claim 1, wherein the predetermined value is based on an operating
voltage of a load driven by the ultracapacitor.
3. The system of claim 1, wherein the extractor includes a linear regulator to increase
voltage output from the ultracapacitor to at least equal the predetermined value.
4. The system of claim 3, further comprising:
a controller to monitor a change in the increased voltage,
wherein the linear regulator adjusts the changed voltage when the monitored
voltage falls below the predetermined value.
5. The system of claim 4, wherein the linear regulator comprises:
a first amplifier to amplify the voltage output from the ultracapacitor to a value
which at least equals the predetermined value, wherein the controller generates signals to modify

resistance along a feedback path of the first amplifier to amplify the output voltage.

6. The system of claim 5, wherein the linear regulator comprises:
a second amplifier to adjust impedance of the amplified voltage output from the first amplifier.

7. The system of claim 1, wherein the extractor includes a switched capacitor voltage converter to increase voltage output from the ultracapacitor to at least equal the predetermined value.

8. The system of claim 7, wherein the switched capacitor voltage converter includes a voltage doubler.

9. The system of claim 7, further comprising:
a controller to monitor a change in the increased voltage; and
a voltage regulator to adjust the changed voltage to maintain the predetermined value.

10. The system of claim 1, wherein the extractor includes an adiabatic amplifier to amplify voltage output from the ultracapacitor by a predetermined factor.

11. The system of claim 10, further comprising:
a controller to monitor a change in the amplified voltage; and
a voltage regulator to adjust the changed voltage to maintain the predetermined value.
12. The system of claim 10, wherein the adiabatic amplifier includes:
at least one transmission gate having an input terminal coupled to the ultracapacitor and an output terminal to output the amplified voltage.
13. The system of claim 1, wherein the extractor is a DC-to-DC boost converter.
14. A method, comprising:
detecting a voltage stored in an ultracapacitor; and
extracting energy from the ultracapacitor when the voltage falls below a predetermined value.
15. The method of claim 14, wherein the predetermined value is based on an operating voltage of a load driven by the ultracapacitor voltage.

16. The method of claim 15, wherein extracting energy includes:
increasing voltage output from the ultracapacitor to a value which at least equals
the operating voltage of the load; and
driving the load with the increased voltage.
17. The method of claim 16, further comprising:
detecting a reduction in the increased voltage over time; and
adjusting the reduced voltage to maintain at least the load operating voltage.
18. The method of claim 14, wherein increasing the voltage is performed by a circuit
which includes a linear regulator.
19. The method of claim 14, wherein increasing the voltage is performed by a circuit
which includes a switched capacitor voltage converter.
20. The method of claim 14, wherein increasing the voltage is performed by a circuit
which includes an adiabatic amplifier.
21. The method of claim 14, wherein increasing the voltage is performed by a circuit
which includes a DC-to-DC boost converter.

22. A method, comprising:
- detecting a voltage stored in an ultracapacitor coupled to a load;
 - connecting an energy extraction circuit between the ultracapacitor and load when the voltage falls below an operating voltage of the load; and
 - increasing the voltage to at least the operating voltage of the load using the energy extraction circuit.
23. The method of claim 22, further comprising:
- detecting a reduction in the increased voltage over time; and
 - adjusting the reduced voltage to maintain at least the operating voltage of the load.
24. The method of claim 22, further comprising:
- disconnecting the energy extraction circuit from at least one of the ultracapacitor and load when the increased voltage falls below an operating voltage of the energy extraction circuit.
25. A system, comprising:
- a load;
 - an ultracapacitor storing a voltage to drive the load; and
 - an extractor to extract energy from the ultracapacitor when the voltage falls below a predetermined value.

26. The system of claim 25, wherein the predetermined value is based on an operating voltage of the load.

27. The system of claim 25, wherein the load is at least one of a power supply, processor, cache, chipset, and a memory.

28. The system of claim 25, wherein the load, ultracapacitor, and extractor are included on a single die.